REMARKS

In view of the above amendments and the following remarks, reconsideration of the rejections set forth in the Office Action of May 15, 2007 is respectfully requested.

Claims 1-25 are pending in this application. Claims 1, 3, 4, 6-11, 18, 19 and 21-25 stand rejected. Claim 3 is cancelled herein. Claims 2, 5, 12-17 and 20 are withdrawn from consideration. No new matter has been added.

The title of the invention has been objected to by the Examiner. The Applicants have amended the title as suggested by the Examiner. Accordingly, the Applicants respectfully submit that the title, as amended, satisfies the Examiner's concerns.

For the reasons set forth above, the Applicants respectfully request that the objection to the title be withdrawn.

Claims 1, 3, 4, 6-11, 18, 19 and 21-25 have been rejected under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicants regard as the invention. Specifically, the Examiner asserts that in lines 10-11 of claim 1, it is indefinite as to whether "said flexible substrates" refers to that set forth in line 2 of claim 1, that set forth in lines 3-4 of claim 1, or that set forth in line 4 of claim 1. The Applicants have amended claim 1 to resolve these §112 second paragraph issues. Accordingly, the Applicants submit that claim 1, as amended, satisfies §112, second paragraph.

For the reasons set forth above, the Applicants respectfully request that the §112, second paragraph, rejections of claims 1, 3, 4, 6-11, 18, 19 and 21-25 be withdrawn.

Claims 1, 3, 7 and 9 have been rejected under 35 U.S.C. §102(b) as being anticipated by Takeuchi et al. (U.S. Patent Application Publication No. 2002/0017014) (hereinafter referred to "Takeuchi"). Claims 1, 8, 9, 11, 23 and 24 have been rejected under 35 U.S.C. §102(b) as being anticipated by Inagaki et al. (U.S. Patent Application Publication No. 2002/0012194) (hereinafter referred to as "Inagaki"). Claims 1, 4, 6, 8-11, 19, 21 and 23-25 have been rejected under 35 U.S.C. §102(b) as being anticipated by Kuwajima et al. (U.S. Patent Application Publication No. 2001/0021086) (hereinafter referred to as "Kuwajima").

With exemplary reference to the Figures, claim 1 sets forth a piezoelectric actuator comprising a flexible substrate 8c including a slit 30 as to form a first flexible

substrate 8a and a second flexible substrate 8b, such that the first and second flexible substrates 8a, 8b are positioned in a same plane and are separated by the slit 30. Moreover, the piezoelectric actuator set forth in claim 1 includes a first piezoelectric element unit 10a disposed on the first flexible substrate 8a, and a second piezoelectric element unit 10b disposed on the second flexible substrate 8b approximately in parallel with the first piezoelectric element unit 10a such that the first and second piezoelectric element units 10a, 10b are separated from each other by the slit 30. Furthermore, the piezoelectric actuator as set forth in claim 1 includes a coupling portion 40 that extends across the slit 30 and couples the first flexible substrate 8a to the second flexible substrate 8b to suppress a wavy resonance phenomenon of the first flexible substrate 8a and the second flexible substrate 8b. The coupling portion 40 is positioned to correspond to a location of an antinode of a primary bending mode of the first piezoelectric element unit 10a and the second piezoelectric element unit 10b, and each of the first and second piezoelectric element units 10a, 10b include a first end and a second end, where the first and second ends of the first piezoelectric element unit 10a are fixed on the first flexible substrate 8a, and where the first and second ends of the second piezoelectric element unit 10b are fixed on the second flexible substrate 8b.

Thus, claim 1 requires a piezoelectric actuator including, in part, a flexible substrate including a slit so as to form a first flexible substrate and a second substrate that are positioned in a same plane and are separated by the slit, and a coupling portion that extends across the slit and couples the first flexible substrate to the second flexible substrate to suppress a wavy resonance phenomenon of the first flexible substrate and the second flexible substrate, such that the coupling portion is positioned to correspond to a location of an antinode of a primary bending mode of the first piezoelectric element unit and the second piezoelectric element unit, wherein each of the first and second piezoelectric element units include a first end and a second end, where the first and second ends of the first piezoelectric element unit are fixed on the first flexible substrate, and where the first and second ends of the second piezoelectric element unit are fixed on the second flexible substrate.

In contrast, Takeuchi discloses a piezoelectric/electrostrictive device having a moveable portion being operated based on a displacement of a

piezoelectric/electrostrictive element. More specifically, Takeuchi discloses a piezoelectric/electrostrictive device 1 including a driving portion 3 which is driven by a displacement of a piezoelectric element 2, a moveable portion 4 which is operated based on driving of the driving portion 3, and a fixing portion 5 which holds the driving portion 3 and the moveable portion 4. The driving portion 3 includes a pair of parallel thin plates, 6 and 7, facing each other across a gap, and comprises a film-like piezoelectric/electrostrictive element 2 formed on an outer surface of at least one of the thin plates 6, 7. The fixing portion 5 is coupled with the moveable portion 4 via the driving portion 3, and a hole 8 is defined by inner walls of thin plates 6 and 7, an inner wall of the moveable portion 4, and an inner wall of the fixing portion 5. A beam bridge 12 is positioned between thin plates 6 and 7 in the hole 8, proximate its midpoint, to increase the stiffness and the resonance frequency of the device 1. Notably, Takeuchi does not disclose the thin plates 6 and 7 positioned in a same plane and being separated by a slit, and positioning the beam bridge 12 between thin plates 6 and 7 to correspond to a location of an antinode of a primary bending mode of the piezoelectric/electrostrictive elements 2. Instead, Takeuchi discloses positioning thin plates 6 and 7 parallel to each other such that they face each other across a gap, and positioning the beam bridge 12 between thin plates 6 and 7 proximate a midpoint of hole 8.

Based on the above discussion, it is apparent that the device of Takeuchi teaches positioning thin plates 6 and 7 parallel to each other such that they face each other across a gap, and positioning the beam bridge 12 between thin plates 6 and 7 proximate a midpoint of hole 8. Moreover, there is no disclosure or suggestion in Takeuchi to position thin plates 6 and 7 such that they are in a same plane and are separated by a slit. Furthermore, there is no disclosure or suggestion in Takeuchi to locate the beam bridge 12 between thin plates 6 and 7, within the hole 8, to optimally ameliorate a wavy resonance phenomenon of the thin plates 6 and 7 by positioning the beam bridge 12 to correspond to a location of an antinode of a primary bending mode of the piezoelectric/electrostrictive elements 2. In other words, Takeuchi does not disclose a piezoelectric actuator, including, in part, a flexible substrate including a slit so as to form a first flexible substrate and a second flexible substrate that are positioned in a same plane and are separated by the slit, and a coupling portion that extends across the slit and

couples the first flexible substrate to the second flexible substrate to suppress a wavy resonance phenomenon of the first flexible substrate and the second flexible substrate, such that the coupling portion is positioned to correspond to a location of an antinode of a primary bending mode of the first piezoelectric element unit and the second piezoelectric element unit, wherein each of the first and second piezoelectric element units include a first end and a second end, where the first and second ends of the first piezoelectric element unit are fixed on the first flexible substrate, and where the first and second ends of the second piezoelectric element unit are fixed on the second flexible substrate.

For the above reasons, it is believed clear that claim 1 is not anticipated by Takeuchi. Further, it is submitted that there is no teaching or suggestion in the prior art of record that would have caused an ordinary artisan to modify Takeuchi in such a manner as to result in, or otherwise render obvious, the invention of claim 1.

The Examiner cited Inagaki to reject claims 1, 8, 9, 11, 23 and 24 and cited Kuwajima to reject claims 1, 4, 6, 8-11, 19, 21 and 23-25. Claim 1 has been amended to include the subject matter of cancelled claim 3. Thus, because neither Inagaki nor Kuwajima was used to reject cancelled claim 3, the Applicants respectfully submit that the rejections of claim 1 based on Inagaki and Kuwajima are moot.

Because of the above mentioned distinctions, it is believed clear that claim 1, and claims 4, 6-11, 18, 19 and 21-25 depending therefrom, are patentable over the references relied upon in the rejections. Therefore, it is submitted that claims 1, 4, 6-11, 18, 19 and 21-30 are clearly allowable over the prior art of record.

In view of the foregoing amendments and remarks, all of the claims now active in this application are believed to be in condition for allowance. Reconsideration and favorable action are respectfully solicited.

Should the Examiner believe there are any remaining issues that must be resolved before this application can be passed to issue, it is respectfully requested that the Examiner contact the undersigned by telephone in order to resolve such issues.

Respectfully submitted,

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